Expanding the benefits of HPV vaccination to boys and men

Human papillomavirus (HPV) is the most common sexually transmitted infection. It affects 80% of the population, with the initial infection usually occurring between 15 and 24 years of age. Persistent infection with high-risk oncogenic HPV genotypes, primarily types 16 and 18, is the cause of almost all cervical cancers. HPV is also thought to cause about 95% of anal cancers, 75% of oropharyngeal cancers, 75% of vaginal cancers, 70% of vulvar cancers, and 60% of penile cancers. Low-risk or non-oncogenic genotypes (eg, types 6 and 11) cause anogenital warts, low-grade cervical disease, and recurrent respiratory papillomatosis. In the USA, the incidence of oropharyngeal cancer in men now exceeds that of cervical cancer in women, and by 2020 the annual number of HPV-associated oropharyngeal cancers will exceed that of cervical cancers. As a result, it is important to consider ways to expand our HPV prevention efforts to boys and men.

Available prophylactic HPV vaccines include Gardasil (Merck), a quadrivalent vaccine approved by the US Food and Drug Administration in 2006 that protects against HPV types 6, 11, 16, and 18; Cervarix (GlaxoSmithKline), a bivalent vaccine approved in 2009 against HPV types 16 and 18; and Gardasil 9 (Merck), a nine-valent vaccine approved in 2014 that offers protection against five additional oncogenic genotypes (types 31, 33, 45, 52, and 58) in addition to types 6, 11, 16, and 18. The recommendations for vaccine administration vary slightly by country and vaccine type, but the primary target group is adolescents aged 9–13 years, with catch-up vaccination up to age 26 years. Importantly, these vaccines do not treat existing infection or disease and are therefore intended for individuals before initiation of sexual activity and exposure to HPV. Extensive studies have shown these vaccines to be safe and not associated with increased sexual activity or earlier sexual debut among adolescents.

Although it will take decades to show a reduction in HPV-associated cancers from the introduction of HPV vaccination, recent reports are encouraging. In March, 2016, the US Centers for Disease Control and Prevention reported a study comparing HPV infection rates before (2003–06) and after (2009–12) the vaccine was introduced in girls who received at least one dose of the quadrivalent vaccine. The prevalence of HPV types 6, 11, 16, and 18 decreased by 64% in sexually active girls and women aged 14–19 years and by 34% in those aged 20–24 years. Previously, an Australian study had shown that the proportion of girls and women, as well as boys and men, developing genital warts decreased significantly after the implementation of a national HPV vaccination programme in 2007.

However, despite the proven efficacy and safety of the HPV vaccines, uptake has been variable. In the USA, only 40% of girls and 22% of boys have completed the three-dose series. Reasons for low vaccination rates include inadequate provider recommendations, parent opposition, few state-level mandates requiring HPV vaccination for school enrolment, and the absence of school-based immunisation programmes. In comparison, Australia, Belgium, the UK, and Canada have HPV vaccination rates exceeding 70% in girls (in both boys and girls in Australia), showing that high rates are achievable through national vaccination programmes. In low-income countries, GAVI has played a pivotal part in obtaining HPV vaccines at an affordable price and implementing national vaccination programmes. A prominent example is Rwanda, where more than 90% of eligible girls have undergone HPV vaccination. However, many countries in sub-Saharan Africa do not have vaccination or screening programmes, and cervical cancer continues to be a leading cause of cancer-related death among women.
For boys and men, the scenario is different and needs our attention. Although cervical cancer has the highest HPV-associated cancer burden worldwide and is increasingly being recognised as a public health concern, other HPV-associated cancers, such as oropharyngeal, anal, and penile cancers, also result in substantial morbidity and mortality. Vaccination was not recommended for boys until 2011, lagging behind the recommendation for girls in 2006. Australia implemented a national vaccination programme for girls in 2007, which was subsequently expanded to include boys in 2012. In fact, most programmes worldwide do not include a recommendation to vaccinate boys, mainly because of cost and little recognition of an emerging epidemic of HPV-associated cancers in men. In the USA, 78% of HPV-associated cancers in men are oropharyngeal cancers.\(^1\) The incidence of all oropharyngeal cancers is rising at 5% annually and has surpassed that of cervical cancer in incidence of all oropharyngeal cancers is rising at 5% annually and has surpassed that of cervical cancer in

loss of life, and financial burden.

The unprecedented progress in our understanding of the role of HPV in cancer and the development of effective and safe vaccines can decrease the HPV-associated cancer burden only if vaccination rates for girls and boys improve substantially worldwide. An aggressive stance on HPV immunisation and screening is needed to prevent the loss of countless lives from cancers that are largely preventable. Vaccinating girls and boys will lead to decreased HPV transmission rates and increased herd immunity, and will prevent not only cervical cancers but also other HPV-associated malignancies in both women and men.

"Kathleen M Schmeler, Erich M Sturgis
Department of Gynecologic Oncology and Reproductive Medicine (KMS), Department of Head and Neck Surgery (EMS), and Department of Epidemiology (EMS), The University of Texas MD Anderson Cancer Center, Houston, TX 77030, USA
kschmeler@mdanderson.org

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